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## PATENT SPECIFICATION



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### PROVISIONAL SPECIFICATION

#### Improvements in and relating to Decorative Panels or the like

We, HOLOPHANE LIMITED, a company organised and existing under the laws of Great Britain and Northern Ireland, and ROLLO GILLESPIE WILLIAMS, a British subject, both of Holophane House, Elverton Street, Vincent Square, London, S.W.1, do hereby declare the nature of this invention to be as follows:—

This invention relates to decorative lighting and in particular to illuminated panels or the like such as the walls or part of the walls of a large room or a hall, for example the auditorium of a cinematograph or other theatre. Its object is to provide a decorative panel or the like the appearance of which can be changed by changing the illumination thereof.

If the surface of the panel is polished, burnished or silvered or the like, it then becomes extremely directive in its reflecting powers and therefore extremely sensitive as regards the relative direction of illumination and the position of the observer. For example in an auditorium using trough lighting round one or more edges of polished or the like plain wall panel, the light will be to a large extent wasted as regards an observer seated in a usual position, since the directive effect of the troughs and of the panel surface will redirect most of the light incident thereon in a direction away from the usual seats.

To avoid this we break up the surface of such a polished or the like panel as by means of flutes or ribs which will redirect light from a suitable direction towards the observer; by using a suitable cross section of such flutes or ribs, usually a curved section, the flutes or ribs can be made to appear brilliantly illuminated from any of many positions, for instance from any seat of an auditorium from which the panel is visible. We further arrange such flutes or prisms so that some are rendered practically invisible by light from one direction and some from another and use selectively controllable light sources. The degree of invisibility will depend to some extent on the directive effect of the light source and the effect will be increased by the relative brilliance of those flutes or ribs which are being illuminated. For instance some flutes or ribs may be hori-

zontal and will then be responsive to light from horizontally arranged troughs at the top and bottom of a panel, and others may be vertical and responsive to vertically arranged troughs at the sides of a panel. Thus by arranging the flutes or ribs in two different designs either design can be made apparent by switching on the appropriate light source. It is further possible to have more than two alternative designs and directions of light.

By suitable formation some parts of the panel may be included in more than one design. Thus for inclusion in two designs a series of parallel shallow flutes of curved cross section may be provided over part of their width with narrow cross ribs of suitable section; then when light is directed from an edge of the panel along the flutes, the flutes are more or less invisible but the ribs become brilliantly apparent, while if light is directed from an edge of the panel across the flutes, the latter become brilliantly apparent while the prisms or ribs are more or less invisible.

We prefer to use light sources which can be controlled to give varying colours, for example three colour troughs with suitable dimmer control. Varying effects can then be produced by using different colours in two (or more) directions simultaneously. This may be combined with actual colouration of part or all of the panel which makes further selective effects possible.

We may also finish parts of the panel either flat or in relief, with a matt or semi-matt white or coloured surface. The visibility of such parts is then more or less independent of the direction of lighting.

In the case of wall panels the panels in accordance with the invention can readily be made of fibrous plaster worked in situ by the usual methods, while suitable light sources such as troughs and colour control systems are also known.

Dated this 24th day of April, 1934.

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[Price 1/-]

Price 25p

## COMPLETE SPECIFICATION

## Improvements in and relating to Decorative Panels or the like

We, HOLOPHANE LIMITED, a company organised and existing under the laws of Great Britain and Northern Ireland, and ROLLO GILLESPIE WILLIAMS, a British subject, both of Holophane House, Elverton Street, Vincent Square, London, S.W.1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to decorative lighting systems of the kind comprising directional light sources and panels, wall surfaces or the like illuminated thereby, in which by means of suitably arranged flutes, ribs or the like upon the surface of the panel or the like, different parts of the panel or the like are made visible to an observer within a particular area, by illuminating the panel or the like from different directions.

When a lighting system of this kind is used in such a place as the auditorium of a cinematograph or other theatre, the desired effects must not only be visible in substantially the same form from observers' positions distributed over a very wide area, but it is also highly desirable that the effects should be as brilliant as possible or in other words that the light available should be utilised as efficiently as possible. To obtain this end, in a system of the kind defined above, according to the present invention, the flutes, ribs or the like are polished, burnished, silvered or similarly treated to give them a directionally reflective effect and they are made of curved section. The reflective effect desired is such as can be obtained for example with silver paint or silver leaf, while the precise curvature of the section of the reflecting surfaces will depend on the area from which they are to be seen and the position of the directional light sources.

It will be understood that by using different coloured light in the different directions, more than one light source can be in use at once, the respective effects being visible in different colours and therefore clearly differentiated one from another.

By suitable formation some regions of the panel may be included in more than one design. Thus for inclusion in two designs a series of parallel shallow flutes of curved cross section may be provided over part of their width with narrow cross ribs of suitable section; then when light is directed from an edge of the panel along

the flutes, the flutes are more or less invisible but the ribs become brilliantly apparent, while if light is directed from an edge of the panel across the flutes, the latter become brilliantly apparent while the prisms or ribs are more or less invisible.

In the case of wall surfaces the flutes, ribs or the like can readily be made of fibrous plaster worked in situ by the usual methods, and afterwards silvered.

In addition to the parts arranged as described above the panels or the like may also comprise certain regions arranged to be responsive to all light sources, for example by providing them with a general irregular surface which may nevertheless be covered with a glossy coating or silvered.

Two very simple examples embodying the invention are diagrammatically illustrated in the accompanying drawings.

Figure 1 is a front view of one embodiment.

Figure 2 is a detail section on the line A—B of Figure 1.

Figure 3 is a front view of the second embodiment and

Figure 4 is a detail section on the line C—D of Figure 2.

The panel shown in Figure 1 comprises a chequer design made up of four squares, 1, 2, 3 and 4. Each square comprises a series of parallel ribs of substantially semicircular cross section as indicated in Figure 2, and the ribs are polished, burnished, silvered or otherwise made of similar reflective character. As shown there are four light sources 5, 6, 7, 8, arranged round the panel, parallel with its sides but a little in front and directing their light across the panel. The ribs in squares 1 and 4 are parallel with sources 5 and 7 and the ribs in squares 2 and 3 are parallel with sources 6 and 8.

If now sources 5 or 7 or 5 and 7 only are in action, to an observer within a fairly wide range of positions in front of the panel, squares 1 and 4 will appear brightly illuminated and squares 2 and 3 unilluminated, because the ribs of squares 1 and 4 will re-direct incident rays over a large region in front of the panel while the ribs in squares 2 and 3 will redirect incident rays almost in the plane of the panel. If now sources 6 or 8 or 6 and 8 only are in action, to the same observer, squares 2 and 3 will appear brilliantly illuminated and squares 1 and 4 unilluminated.

Figure 2 indicates the course of typical

rays and it will be observed that only about one half of each rib receives and redirects rays from one light source; accordingly if the light sources on opposite sides i.e. 5 and 7 or 6 and 8 are of different colours the effect will not be to produce a mixed colour but alternate stripes of the two colours in the squares which appear illuminated. If one pair of light sources is of different colour or colours from the other pair, and if all are in use together, the respective squares will appear to the observer in different colours.

Obviously a chequer pattern is only a simple example and elaborate patterns can be prepared and selectively illuminated in the same way.

The example shown in Figure 3 is designed to select between parallel light sources 9, 10 on opposite sides and as before a simple chequer pattern has been shown. All four squares 11, 12, 13 and 14 are made up of ribs parallel with the light sources, but the ribs in squares 11 and 14 are as far as the observer is concerned, responsive only to source 10 and those in squares 12 and 13 only to source 9. As indicated in Figure 4 the longer edge of each rib section in square 12 is curved so that assuming the rays from source 9 are substantially parallel in a vertical plane normal to the surface of the panel, the rays incident on the curved edge will be redirected to cover substantially the angle E. The short edge of each prism section in square 12 is straight and substantially perpendicular to the rays from source 10 so that they are returned towards this source and do not reach observers located within the angle E. The ribs in square 14 are of similar form but opposite in direction and consequently direct incident rays from source 10 towards the observers and from source 9 back towards the source. It will be understood that the ribs in square 14 will not necessarily be exactly similar in form to the ribs in square 12, but small variations will be made to deal with variations in the exact positions of the light sources and the relation of the parts of the panel to the region in which observers will be located.

As above stated, the ribs in square 11 are similar to those in square 14 and those in square 13 to those in square 12. Accordingly if only source 9 is in action only squares 12 and 13 will appear illuminated to the observer and if only source 10, only squares 11 and 14. If both sources are in use together and are of different colours the whole panel will appear illuminated with a chequer design in two colours. Naturally other regions can be provided responsive only and selectively to further light sources arranged at the sides.

It will be understood that the light sources may be of any known kind suitable for the purpose in view and may be of such kind as will allow the colour to be controlled. Further, portions of the panel instead of being silvered or the like, may be finished with a coloured reflecting surface so as to give a further selective effect.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A decorative lighting system of the kind set forth in which the flutes, ribs or the like are polished, burnished, silvered or similarly treated to give them a directional reflective effect and are made of curved cross section so that substantially the same effect is visible from a wide area.

2. A decorative lighting system according to claim 1 having in addition to the fluted, ribbed or like parts regions which as seen from within the wide area are responsive to light from any source.

3. A decorative lighting system constructed and arranged substantially as described with reference to the accompanying drawings.

Dated this 24th day of May, 1935.

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[This Drawing is a reproduction of the Original on a reduced scale.]

